Prof. Hann shows further that the probabilities of positive temperature variations at Greenwich and negative pressure variations at Stykkisholm, and *vice versâ*, are 0·83 and 0·85 respectively. In the case of the Azores he shows that a similar reversal with Stykkisholm occurs. Interesting results are also obtained when he considers the new station at Angmagsalik, in Greenland.

THE AMERICAN ASSOCIATION.

THE annual meeting of the American Association for the Advancement of Science was held at St. Louis on December 26, 1903, to January 1. The address delivered by the president of the association, Prof. Ira Remsen, appeared in NATURE of January 28; and extracts from the addresses of presidents of some of the sections are given below.

ATOMS AND ELEMENTS.[1]

Is matter continuous or discrete? argued the opposed schools of Grecian philosophy led by Leucippus, Democritus and Epicurus, and dominated by Aristotle. Despite the clarity of the statements of the Roman Lucretius,[2] the atomic hypothesis received scant attention until the seventeenth century of the Christian era, when Galileo's experimental science assailed Aristotelian metaphysics and demanded verification of the premises of that philosophy which had governed all the schools of Europe for two thousand years.[3] While Gassendi, Boyle, Descartes, Newton, perhaps Boscovich, Lavoisier, Swedeborg, Richter, Fischer and Higgins had to do with our modern atomic theory, Dalton one hundred years ago "created a working tool of extraordinary power and usefulness" in the laws of definite and multiple proportions. As Clarke[4] remarked, "Between the atom of Lucretius and the Daltonian atom the kinship is very remote." Although the lineage is direct, the work of Berzelius, Gmelin and others; the laws of Faraday, Gay Lussac, Avogadro, Dulong and Petit; the reformations of Laurent and Gerhardt, but particularly Cannizzaro; the systematisations of de Chancourtois, Newlands, Hinrichs, Mendeléeff and Lothar Meyer; the stereochemistry of van 't Hoff and Le Bel have imperialised the ideas of the Manchester philosopher, so that the conceptions of the conservative atomists of to-day are quite different from those at the beginning of the closed century.[5]

The Daltonian ideas had scarcely reached adolescence before Prout (1815), giving heed to the figures concerned, would have all the elements compounded of hydrogen. The classical atomic mass values obtained by sympathetic Stas and the numerous investigations of those who followed him, with all the refinements human ingenuity has been able to devise, temporarily silenced such speculations, but not until Marignac had halved the unit, Dumas had quartered it, and Zängerle, as late as 1882, insisted upon the one thousandth hydrogen atom.

The notion, like Banquo's ghost, will ever up, for if one may judge from the probability calculations of Mallet (*Phil. Trans.*, clxxi., 1003, 1881) and Strutt (*Phil. Mag.*, (6), i., 311), a profound truth underlies the now crude hypothesis.

Crookes (*Chem. News*, lv., 83, 1886), from observations made during prolonged and painstaking fractionations of certain of the rare earths, supported his previously announced "provisional hypothesis" as to the genesis of the elements from a hypothetical *protyle*, which existed when the universe was without form and void. He designated those intermediate entities, like yttrium, gadolinium and didymium, "meta-elements,"[1] a species of compound radicles, as it were. *Urstoff*, fire mist, protyle, the ultra-gaseous form, the fourth state of matter (Crookes, Royal Societies, June 10, 1880) was condensed by a process analogous to cooling; in short, the elements were created. The rate of the cooling and irregular condensation produced "the atavism of the elements," and this caused the formation of the natural families of the periodic system. Marignac (*Archives des Sciences Physiques et Naturelles*, 17–5; *Chemical News*, lvi., 39), criticising this hypothesis, states:—"I have always admitted[2] the impossibility of accounting for the curious relations which are manifested between the atomic weights of the elements, except by the hypothesis of a general method of formation according to definite though unknown laws; even when these relations have the character of general and absolute laws."

Further, "I do not the less acknowledge that the effect of constant association of these elements is one of the strongest proofs that can be found of the community of their origin. Besides, it is not an isolated fact we can find other examples such as the habitual association in minerals of tantalum, niobium, and titanium."

The peculiar discharge from the negative electrodes of a vacuum tube was investigated many years ago by Hittorf and Crookes, who arrived at the conclusion that it was composed of streams of charged particles. All are familiar with the very recent proposed "electrons" and "corpuscles" resulting from the beautiful physical researches of Lodge and J. J. Thomson. These appear to have caused a trembling in the belief of many in the immutability of the atom, and the complete abandonment of the atom is seriously discussed by others.

Although by chemical means, so far, we have been unable to break up the atoms, apparently electrical energy, in the form of kathode rays, for example, follows the grain of atomic structure. Some advanced thinkers look upon the atoms as disembodied charges of electricity. Ostwald has taught it. Electric charges are known only as united to matter, yet Johnstone Stoney and Larmor, have speculated on the properties of such charges isolated. "Such a charge is inertia, even though attached to no matter, and the increase of inertia of a body due to electrification has been calculated by both Thomson and Oliver Heaviside, the conception accordingly being advanced that all inertia is electrical, and that matter, as we know it, is built up of interlocked positive and negative electrons. If it were possible in any mass of matter to separate these electrons then matter would disappear and there would remain merely two enormous charges of electricity." We are aware of phenomena attributed to the negative electrons; we await anxiously the announcement of the positive electrons.

We do know, however, as A. A. Noyes says, that "there exists in the universe some thing or things other than matter which, by association with it, give rise to the changes in properties which bodies exhibit, and give them power of producing changes in the properties of other bodies."

Shall we say, as does Remsen, "An element is a substance made up of atoms of the same kind?" Can we say that it is not? Venable (the "Definition of the Element," *Am. Chemist*, 1875, 23) truly says: "An element is best defined by means of its properties." These conceits are not exclusive. The properties are the result of the action of physical forces and chemical affinity, whatever that may be. Certain of the novel atmospheric gases have so far responded but poorly to the latter, as predicted before their discovery by Flawitzsky, Julius Thomsen and de Boisbaudran in 1887.

The following simpler definition has finally served as my guide: *An element is that which has not been decomposed, so far as we are aware, into anything other than itself.* In short, it is consistent.

We have decided to define an element by its properties. The alterations produced in the properties of the most characteristic elements by the presence of small amounts of foreign substances are evident in steel. The influence of arsenic upon the conductivity of copper is well known, and Le Bon (*Compt. rend.*, cxxxi., 706, 1900) has recently shown

1 Abridged from an address delivered before the Section of Chemistry of the American Association by Prof. C. Baskerville.

2 "Nature reserving these as seeds of things
Permits in them no minish nor decay;
They can't be fewer and they can't be less."

Again, of compounds—

"Decay of some leaves others free to grow
And thus the sum of things rests unimpaired."
Book ii., 79.

3 See "The Atomic Theory," the Wilde Lecture by F. W. Clarke at Dalton Celebration, May, 1903.

4 *Loc. cit.*

5 While I have examined much of the original literature, Venable's "History of the Periodic Law" has been most helpful. I have, furthermore, had the privilege of reading very carefully the manuscript of a work entitled "The Study of the Atom" (in press), by Dr. Venable.

1 Address before Chemical Section of the British Association, *Chem. News*, liv., 117, 1885.

2 Remarks made in 1860–5 after publication of Stas's "Researches on Atomic Weights," *Archives*, ix., 102, 24–376.

that traces of magnesium (one part in 14,000) in mercury cause the latter to decompose water and to oxidise rapidly in the air at ordinary temperatures. Thorium with less than a trace of actinium produces an auto-photograph.

This point cannot be too strongly stressed in the rare earth field. One who has wrought with thorium dioxide well knows the influence a small amount of cerium has upon its solubility. The conflicting statements in the literature as to the colours of the oxides of the complexes, neodidymium and præseodidymium, cause one to wonder if different researchers have had the same hæcceity.

An appeal to the spectroscope is, of course, in the minds of all my hearers.

Grünwald, in a series of papers on his theory of spectrum analysis,[1] endeavours "to discover relations between the spectra and thus to arrive at simpler, if not fundamental 'elements.'" He came to the conclusion that "all the so-called elements are compounds of the primary elements *a* and *b*" (coronium and helium). Ames (*Am. Chem. J.*, xi., 138, 1889), having directed attention to the use of uncorrected data by Grünwald, remarks: "The concave grating gives the only accurate method of determining the ultra-violet wave-lengths of the elements; and as a consequence of not using it, most of the tables of wave-lengths so far published are not of much value."

Lockyer maintained that the lines of certain brilliant substances vary not only in length and in number, but also in brilliancy and in breadth, depending upon the quantity of the substance as well as temperature (Roy. Soc. *Proc.*, lxi., 148, 183; *Chem. News*, lxxix., 145). Being unable to decompose the elements in the laboratory, he studied the spectra of the stars. The spectra of the colder stars show many more metals, but no metalloids, whereas the coldest stars show the Crookes spectrum of metalloids which are compounds; none of the metalloids are found in the spectrum of the sun. More than 100,000 visual observations and 2000 photographs were made in the researches.

Without doubt the spectroscopic criteria are the most valuable we have in judging finally the elements, and mayhap will remain so, but in my humble opinion, such have not alone sufficient authority, as yet, to usher the aspirant to a place among the elect. The contention frames itself, however, in an expression of the need for uniformity.

Whether we follow the most advanced metaphysico-chemical teachings or no, if there be any one concept upon which modern practical chemical thought depends, it is the law of definiteness of composition. There may be, and doubtless are, definite, perhaps invariable, properties of our elements other than their combining proportions, the atomic weights, if you please, yet, so far as we know, they approximate more closely than any fixed, if not permanent, ratios. Many of these values, by which we lay such store, are dependent upon data in which, I venture the assertion, too great confidence has been bestowed, or opinions to which sufficient attention has not been given.

As hinted at in the earlier portion of this unduly prolonged address, many have theorised as to the ultimate composition of matter. The logic of Larmor's (*Phil. Mag.*, December, 1897, 506) theory, involving the idea of an ionic substratum of matter, the support of J. J. Thomson's (*Phil. Mag.*, October, 1897, 312) experiments, the confirmation of Zeemann's phenomenon, the emanations of Rutherford, Martin's (*Chem. News*, lxxxv., 205, 1902) explanations, cannot fail to cause credence in the correctness of Crookes's idea of a fourth state of matter (*Phil. Trans.*, ii., 1881, 433). In the inaugural address as president of the British Association (1898), he acknowledges in the mechanical construction of the Röntgen ray tubes a suggestion by Silvanus Thompson to use for the antikathode a metal of high atomic weight. Osmium and iridium were used, thorium tried, and in 1896 Crookes obtained better results with metallic uranium than platinum.

These and the facts that most of the elements with high atomic weights, in fact all above 200 (thallium not reported on),[1] exhibit radio-active properties, are doubtless closely associated and have to do with the eventual composition of matter. I have unverified observations which go to show the existence of at least one element with a very high atomic weight. If it be confirmed, then we have them now or they are making, and probably breaking up, as shown by that marvellous class of elements in the discovery of which the Curies have been pioneers.

If our ideas that all known elements come from some primordial material be true, then it stands to reason that we are coming in time, perhaps, to that fixed thing, a frozen ether, the fifth state of matter. I may make use of dangerous analogy and liken our known elements, arranged in a perfected natural system, to the visible material spectrum, while electrons, &c., constitute the ultra-violet and *cosmyle* composes the infra-red, either one of the latter by proper conditions being convertible into perceptible elemental matter.

1 "Uber das Wasserspectrum- das Hydrogen. und Oxygenspectrum," *Phil. Mag.*, xxiv., 304, 1887. "Math. Spectralanalyse des Magnesiums und der Kohle." *Monatshefte für Chemie*, viii., 650. "Math. Spectralanalyse des Kadmiums," *Monatshefte für Chemie*, ix., 956.

THE SCOPE OF GEOGRAPHY.[2]

The essential in geography is a relation between the elements of terrestrial environment and the items of organic response; this being only a modernised extension of Ritter's view. Everything that involves such a relationship is to that extent geographic. Anything in which such a relationship is wanting is to that extent not geographic. The location of a manufacturing village at a point where a stream affords water-power is an example of the kind of relation that is meant, and if this example is accepted, then the reasonable principle of continuity will guide us to include under geography every other example in which the way that organic forms have of doing things is conditioned by their inorganic environment. The organic part of geography must not be limited to man, because the time is now past when man is studied altogether apart from the other forms of life on the earth. The colonies of ants on our western deserts, with their burrows, their hills, their roads and their threshing floors, exhibit responses to elements of environment found in soil and climate as clearly as a manufacturing village exhibits a response to water-power. The different coloration of the dorsal and ventral parts of fish is a response to the external illumination of our non-luminous earth. The word *arrive* is a persistent memorial of the importance long ago attached to a successful crossing of the shore line that separates sea and land. It is not significant whether the relation and the elements that enter into it are of easy or difficult understanding, nor whether they are what we call important or unimportant, familiar or unfamiliar. The essential quality of geography is that it involves relations of things organic and inorganic; and the entire content of geography would include all such relations.

Thus defined, geography has two chief divisions. Everything about the earth or any inorganic part of it, considered as an element of the environment by which the organic inhabitants are conditioned, belongs under physical geography or physiography.[3] Every item in which the organic inhabitants of the earth—plant, animal or man—show a response to the elements of environment, belongs under organic geography. Geography proper involves a consideration of relations in which the things that belong under its two divisions are involved.

Geography is, therefore, not simply a description of places; it is not simply an account of the earth *and* of its inhabitants, each described independently of the other; it involves a relation of some element of physical geography to some item of organic geography, and nothing from which this relation is absent possesses the essential quality of geographical discipline. The location of a cape or of a city is an elementary fact which may be built up with other facts into a relation of full geographic meaning; but taken alone, it has about the same rank in geography that spelling has in language. A map has about the same place in geography

1 See the exquisite paper by Madame Curie on "Radio-active Substances," also "Radio-active Lead," Hofmann and Strauss, *Berichte* xxxiv., 3033, Pellini (*loc. cit.*) on "Radio-active Tellurium"; Strutt, *Phil. Mag.*, vi., 113, Elster and Geitel, Giesel, Marckwald, &c.

2 Abridged from an address delivered before the Section of Geology and Geography of the American Association by Prof. W. M. Davis

3 It should be noted that the British definition of physiography gives it a much wider meaning than is here indicated.

that a dictionary has in literature. The mean annual temperature of a given station, and the occurrence of a certain plant in a certain locality, are facts of kinds that must enter extensively into the relationships with which geography deals; but these facts, standing alone, are wanting in the essential quality of mature geographical science. Not only so; many facts of these kinds may, when treated in other relations, enter into other sciences; for it is not so much the thing that is studied as the relation in which it is studied that determines the science to which it belongs.

There can be no just complaint of narrowness in a science that has charge of all the relations among the elements of terrestrial environment and the items of organic response. Indeed, the criticism usually made upon the subject thus defined is, as has already been pointed out, that it is too broad, too vaguely limited and too much concerned with all sorts of things to have sufficient unity and coherence for a real science. Some persons, indeed, object that geography has no right to existence as a separate science; that it is chiefly a compound of parts of other sciences; but if it be defined as concerned with the relationships that have been just specified, these objections have little force. It is true, indeed, that the things with which geography must deal are dealt with in other sciences as well, but this is also the case with astronomy, physics, chemistry, geology, botany, zoology, history, economics, and other sciences. There is no subject of study the facts of which are independent of all other subjects; not only are the same things studied under different sciences, but every science employs some of the methods and results of other sciences. The individuality of a science depends not on its having to do with things that are cared for by no other science, or on its employing methods that are used in no other science, but on its studying these things and employing these methods in order to gain its own well-defined object. Chemistry, for example, is concerned with the study of material substances in relation to their constitution, but it constantly and most properly employs physical and mathematical methods in reaching its ends. Botanists and zoologists are much interested in the chemical composition and physical action of plants and animals, because the facts of composition and action enter so largely into the understanding of plants and animals considered as living beings. Overlappings of the kind thus indicated are common enough, and geography, as well as other sciences, exhibits them in abundance. It may be that geography has a greater amount of overlapping than any other science; but no valid objection to its content can be made on that ground; the maximum of overlapping must occur in one science or another—there can be no discredit to the science on that account. Geography has to do with rocks the origin of which is studied in geology; with the currents of the atmosphere, the processes of which exemplify general laws that are studied in physics; with plants and animals, the forms and manner of growth of which are the first care of the botanist and zoologist; and with man, whose actions recorded in order of time occupy the historian; but the particular point of view from which the geographer studies all these things makes them as much his own property as they are the property of anyone else.

SOME UNSOLVED PROBLEMS OF ORGANIC ADAPTATION.[1]

The recent impulse which has come to biologic progress by experimental methods, and the remarkable results which have been attained thereby, may without exaggeration be said to have raised anew many an earlier doubt as well as brought to light problems apparently beyond the scope of the older explanations. It may not, therefore, be an extravagant assumption to announce the entire question of organic adaptations as open for reconsideration, in the light of which no apology will be necessary for directing attention to certain phases of the subject upon the present occasion.

Among the many problems which recent investigations and conclusions have brought into better perspective as well as sharper definition, and which might profitably be discussed, the limits of a single address preclude any very wide range of review. I have, therefore, chosen to restrict my discussion chiefly to problems of coloration among lower invertebrates, including incidental references to correlated subjects, and the probable limitations of colour as a factor in organic adaptation.

As is perfectly well known, colour in nature is due to one of two causes, or to a combination of both, namely, (1) what has been termed optical or structural conditions, such as diffraction, interference or unequal reflection of light, examples of which are familiar in the splendid hues of the rainbow, the iridescent sheen and metallic colours of the feathers of many birds, wings of insects, &c. (2) What are known as pigmentary colours, due to certain material substances lodged within the tissues of animals or plants which have the property of absorbing certain elements of light and of reflecting others, and thereby producing the sensation of colour. While the two are physically quite distinct it is not unusual to find them associated in producing some of the most exquisite colour effects of which we have knowledge. In a general way one may usually distinguish between these two sorts of colour by noting that those which are purely optical in their character produce a constantly changing impression as the relative position of object or observer may happen to vary with reference to the angle and direction of light; while, upon the other hand, colours which are due to pigments show this property very slightly or not at all, and that, moreover, pigment colours are usually more or less soluble in various reagents, such as alcohol, ether, acids, alkalies, &c., and that they often fade rapidly under the influence of strong light or in its absence, or upon the death of the organism.

The work of Krukenburg, MacMun, Macallum, M'Kendric, Hopkins, Urech, Eisig, Cunningham, and a host of others, comprising a mass of literature of enormous proportions, will be available to those interested, and may afford some faint conception of the magnitude and importance of the field to be explored, as well as an introduction to that already made available. And while as a result of this activity many and various organic pigments have been isolated and their composition in part or entirely made known, it must be recognised that the task of the chemical analysis of any such highly complex compounds as most of these are known to be is attended with extreme difficulty and no small measure of uncertainty. Still, it has been possible fairly to distinguish several classes of such pigments, differentiated physiologically as follows:—

(1) Those directly serviceable in the vital processes of the organism. Under this head may be classed such pigments as hæmoglobin, chlorophyll, zoonerythrin, chlorocruorin, and perhaps others less known. It need not be emphasised that by far the most important of these are the two first named. The others, found chiefly among the lower invertebrates, are believed to serve a function similar to the first.

(2) Waste products. Among these the several biliary products are too well known to call for special note. Guanin is a pigment of common occurrence in the skin of certain fishes, and is associated with the coloration of the species. Similarly certain colouring matters have been found in the pigments of many Lepidoptera, known as lepidotic acid, a substance closely allied to uric acid, and undoubtedly of the nature of a waste product.

(3) Reserve products. Of these there are several series, one of which, known as lipochrome pigments, is associated with the metabolism involved in the formation of fats and oils. Perhaps of similar character are such pigments as carmine, or rather cochineal, melanin, &c. It may be somewhat doubtful whether these pigments do not rather belong to the previous class, where should probably be listed such products as hæmatoxylin, indigo, &c., all of which have been claimed as resultants of destructive metabolism in process of being eliminated from the physiologically active tissues of the body of the organism. Of similar character is probably tannic acid, a substance well known among plant products and involved in the formation of many of the brownish and rusty colours of autumn foliage, particularly of the oaks and allied trees, as are the lipochromes in the formation of the reds and yellows which form so conspicuous a feature among autumn colours.

While the association of these and other pigmentary matters has long been known in connection with both animal and plant growth, and while the conception of their more or less intimate relation to the active metabolism of the various tissues is not new, comparatively little has been

[1] Abridged from an address delivered before the Section of Zoology of the American Association by Prof. C. W. Hargitt.

done toward directly investigating and elucidating the exact nature and extent of the process. This seems to be especially the case in relation to the part played by these products in the formation of those features of coloration among organisms with which we are now concerned.

From considerations of researches connected with various organisms three things seem to be more or less evident:—

(1) That in all regenerative processes a very marked degree of metabolism is involved, whether in the mere metamorphosis of old tissues into new, or in the direct regeneration of new tissues by growth processes, both of which seem to occur.

(2) That in regenerative processes there is often associated the development of pigmentary substances which seem to have no direct function in relation thereto.

(3) That in many cases there follows a more or less active excretion and elimination of portions of the pigment in question.

In the present review I have not in the least sought to ignore or discredit the value of natural selection as a factor in organic evolution. Nor would I be understood as wholly discarding colour as a factor in organic adaptation, particularly among the higher and more specialised forms, but rather to show its limits. At the same time I must submit to a growing conviction that its importance has been largely overestimated, and that other factors have been as largely lost sight of. If the present discussion may serve in even the smallest degree to direct attention to some of the latter it will have served its chief purpose.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—An examination in tropical medicine and hygiene will be held during the year 1904. The examination will begin on August 9, and extend over three days. The examination will have reference to the nature, incidence, prevention, and treatment of the epidemic and other diseases prevalent in tropical countries. Every candidate who passes the examination to the satisfaction of the examiners will receive from the university a diploma testifying to his knowledge and skill in tropical medicine and hygiene. All applications for information respecting the examination should be addressed to Mr. G. H. F. Nuttall, Pathological Laboratory, Cambridge.

THE Education Committee of the Manchester City Council has unanimously resolved to recommend that a grant of 4000*l.* be given from the city rates in aid of the University of Manchester.

IT is announced in *Science* that Prof. John Hays Hammond has added 10,000*l.* to his previous gift of 10,000*l.* for a metallurgical laboratory of Yale University, and that by the will of the late James A. Woolson Boston University will ultimately receive 120,000*l.*, Radcliffe College 60,000*l.*, and the Wesleyan Academy at Wilbraham, Mass., 60,000*l.*

MR. P. N. RUSSELL, who for many years carried on extensive engineering works in Sydney, but has latterly resided in London, has made a further donation of 50,000*l.* for an additional endowment to the School of Engineering at the University of Sydney. Mr. Russell originated this school about seven years ago by an endowment of 50,000*l.*

LORD KELVIN will distribute the prizes at the Northampton Institute, London, on Friday, February 26. The students' conversazione will be held on the same evening, and will be continued on the evening of Saturday, February 27, when the building will be thrown open to the whole of the members and students of the institute and their friends.

THE annual report of the Carnegie Trust for the universities of Scotland was submitted to the trustees at their third annual meeting, which was held in London on Friday last. The report states that the scheme of allocation for five years of an annual grant of 40,000*l.* among the four Scottish universities became operative on January 1, 1903. Of the grant for the year ended December 31, 1903, sums amounting to 20,325*l.* have been claimed and handed over. One chair has been founded and its first occupant appointed —the Burnett Fletcher chair of history and archæology in the University of Aberdeen. Of the sum of 20,000*l.* required for the endowment of this chair, donations amounting to about 12,000*l.* have been received from the Burnett trustees, Mrs. Fletcher, and others. The ordinance instituting a chair of geology in the University of Glasgow has been approved by Parliament, and it is expected that a professor will be appointed before next winter session, when the accumulations in hand of the annual grant of 2000*l.* assigned towards the endowment of this chair will be available, together with such portion of the future annual grants as may be needed to complete the endowment fund of 15,000*l.*, half of which is provided by the Bellahouston trustees and others. In the University of St. Andrews two lectureships—in French and in botany—have been established, each with an endowment of 10,000*l.* Under the scheme of endowment of post-graduate study and research the committee has made the first awards. The estimated outlay under this head for the academic year 1903–4 is 3524*l.*, of which the sum of 1828*l.* was expended within the year 1903. The committee has entered into an agreement with the Royal College of Physicians of Edinburgh by which the trust has purchased the property and laboratory of the college in Forrest Road, Edinburgh, for 10,000*l.*, on the understanding that the College of Physicians and the College of Surgeons continue their present annual contributions of 750*l.* and 200*l.* respectively to the working of the laboratory.

THE second annual report of the executive committee in connection with the fund for advanced university education and research at University College, London, was presented at the annual general meeting of the members of the college on February 24. It will be remembered that the two main purposes of the fund are:—(1) to raise the sum of 200,000*l.* to bring about the incorporation of University College in the University of London, and thus to promote the unification of university studies in London; (2) To provide the sum necessary to equip and endow University College adequately for its work as an integral part of the University of London. For this purpose it was estimated that a capital sum of 800,000*l.* was required, or an income corresponding to such capital sum. For the first of these purposes the committee has raised 141,000*l.*, leaving a balance of 59,000*l.* necessary to enable the conditions of incorporation to be fulfilled. Since August 31, 1903, a most important addition has been made to the fund owing to the munificence of an anonymous donor, who, through Prof. E. H. Starling, F.R.S., and Dr. Page May, promised the sum of 50,000*l.* This sum, together with additional subscriptions received since the date mentioned, brings the total amount raised up to 167,287*l.*, of which 141,000*l.* is available for the purpose of incorporation and the balance of 26,000*l.* for the endowment and equipment of the college. It will be seen that while considerable progress has been made, much remains to be done to realise the whole scheme. It is desirable that the remainder of the money necessary for incorporation should be raised without delay in order to make it possible for a Bill to be introduced in the House of Commons next session. The report of the council of University College presented on the same occasion contains, in addition to full financial statements for the year 1902–1903, an exhaustive list of original papers and other publications completed by members of the staff of the college during the same period, and also particulars of the post-graduate courses of lectures and laboratory work during the present session.

THE secretaries of the Royal Society have addressed a letter to the Vice-Chancellor of the University of Oxford directing attention to a resolution adopted by the president and council of the Royal Society:—"That the universities be respectfully urged to consider the desirability of taking such steps in respect of their regulations as will, as far as possible, ensure that a knowledge of science is recognised in schools and elsewhere as an essential part of general education." Enclosed with the letter was a statement regarding scientific education in schools, drawn up by a committee of the Royal Society, and both are printed in the *Oxford University Gazette*. The statement points out that "it still remains substantially true that the public schools have devised for themselves no adequate way of assimilating